Claims

This listing of the claims shall supersede all previous listings of the claims.

1. (Previously presented) A three dimensional display device comprising:

a display screen having pixels and a pixel width;

an aperture plate including apertures and opaque areas formed by closed apertures between open apertures that is disposed in front of said display screen;

wherein the aperture plate is configured such that the open apertures scan the aperture plate in two-dimensional movements to generate an illusion that the opaque areas are transparent; and

a gap separating said display screen and said aperture plate, said gap being within a range of 0.1cm – 5cm;

wherein the three dimensional display provides multiple different perspectives of a scene that form perceived 3D images of the scene simultaneously viewable from respective multiple different user viewing angles.

2. (Previously presented) The three dimensional display device according to claim 1, further comprising a control system connected to said display screen and said aperture plate, said control system controlling sequencing of image portions on said display screen and controlling sequencing of predetermined apertures of said aperture plate to produce three-dimensional images.

3. (Original) The three dimensional display device according to claim 1, wherein said gap comprises an air gap between said display screen and said aperture plate.

4. (Original) The three dimensional display device according to claim 1, wherein said gap comprises a solid substrate between said display screen and said aperture plate.

5. (Previously presented) The three dimensional display device according to claim 1, wherein said aperture plate is capable of producing vertical slit aperture openings having a slit width.

6. (Original) The three dimensional display device according to claim 5, wherein said slit width is equal to said pixel width.

7. (Original) The three dimensional display device according to claim 5, wherein said slit width is wider than said pixel width.

8. (Original) The three dimensional display device according to claim 1, wherein said aperture plate includes a predetermined number of apertures, said predetermined number of apertures being less than a number of pixels on the display screen.

9. (Previously presented) The three dimensional display device according to claim 1, wherein said aperture plate includes a predetermined number of active regions configured to form open apertures and opaque areas in accordance with an aperture scanning operation, said predetermined number of active regions being equal to a number of pixels on the display screen.

10. (Original) The three dimensional display device according to claim 1, wherein said display comprises a high frame rate video display device having frame rates exceeding 150 frames per second.

11. (Previously presented) The three dimensional display device according to claim 1, wherein said display comprises a high frame rate video display device having a frame rate, wherein said display has a resolution capable of producing at least 8 different perspectives, each different perspective viewable from a different viewing angle.

12. (Previously Presented) The three dimensional display device according to claim 11, wherein said frame rate comprises at least 150 frames per second.

13. (Original) The three dimensional display device according to claim 1, wherein said aperture plate comprises a high speed optical shuttering system.

14. (Original) The three dimensional display device according to claim 10, wherein said display is a direct display and is one selected from a group consisting of Liquid Crystal Display (LCD), Ferroelectric LCD (FLCD), Organic LED (OLED) and Plasma displays.

15. (Original) The three dimensional display device according to claim 10, wherein said display is a rear projection display device.

16. (Previously presented)The three dimensional display device according to claim 15, wherein said display is one selected from a group consisting of a high speed projector and a Digital Light Processing (DLP) projection system.

17. (Previously presented) The three dimensional display device according to claim 7, wherein said aperture plate comprises a solid state scan type aperture plate.

18. (Previously presented) The three dimensional display device according to claim 17, wherein said solid state scan type aperture plate comprises one selected from a group consisting of flat scanners and curved scanners.

19. (Original) The three dimensional display device according to claim 1, wherein said display device comprises a Ferroelectric LCD (FLCD).

20. (Original) The three dimensional display device according to claim 1, wherein said aperture plate comprises a Ferroelectric LCD (FLCD).

21. (Previously presented) A three dimensional display device comprising:

a display screen having pixels and a pixel width;

an aperture plate including apertures and opaque areas formed by closed apertures between open apertures that is disposed in front of said display screen;

wherein the aperture plate is configured such that the open apertures scan the aperture plate in two-dimensional movements to generate an illusion that the opaque areas are transparent; and

a distance separating said display screen and said aperture plate;

wherein combined operation of the aperture plate and display screen generates a three dimensional display exhibiting both horizontal and vertical parallax;

wherein the three dimensional display provides multiple different perspectives of a scene that form perceived 3D images of the scene which are simultaneously viewable from respective multiple different user viewing angles with respect to an open aperture.

22. (Original) The three dimensional display device according to claim 21, wherein said apertures have a size not smaller than a size of said pixels.

23. (Original) The three dimensional display device according to claim 21, wherein said distance is within a range of 0.1cm – 5cm.

24. (Original) The three dimensional display device according to claim 21, wherein said distance separating said display screen from said aperture plate comprises an air gap.

25. (Original) The three dimensional display device according to claim 21, wherein said distance separating said display screen from said aperture plate comprises a solid substrate.

26. (Original) The three dimensional display device according to claim 21, wherein said display screen is dimensionally larger than said aperture plate.

27. (Previously presented) The three dimensional display device according to claim 21, wherein at least one of the perceived 3D images comprises a horizontal view angle range of at least 10 – 30 degrees from normal.

28. (Original) The three dimensional display device according to claim 21, wherein said horizontal parallax has a viewable operating range up to 180 degrees.

29. (Previously presented) The three dimensional display device according to claim 21, wherein the 3D image displayed comprises a vertical view angle range comprises 5 – 25 degrees from normal.

30. (Original) The three dimensional display device according to claim 21, wherein said vertical parallax has a viewable operating range up to 180 degrees.

31. (Previously presented) The three dimensional display device according to claim 21, wherein said display screen comprises a high frame rate video display device.

32. (Previously presented) The three dimensional display device according to claim 31, wherein said display screen comprises a frame rate exceeding 150 frames per second.

33. (Previously presented) The three dimensional display device according to claim 31, wherein said display screen comprises a Ferroelectric LCD (FLCD) device.

34. (Original) The three dimensional display device according to claim 21, wherein said aperture plate comprises a high speed optical shuttering system.

35. (Previously presented) The three dimensional display device according to claim 21, wherein said display screen is one selected from a group consisting of LCD, Ferroelectric LCD, Organic LED (OLED) and Plasma displays.

36. (Previously presented) The three dimensional display device according to claim 21, wherein said display screen is a rear projection display device.

37. (Previously presented) The three dimensional display device according to claim 36, wherein said display screen is one selected from a group consisting of a high speed projector and a DLP.

38. (Previously presented) The three dimensional display device according to claim 32, wherein said aperture plate comprises a solid state scan type.

39. (Previously presented) The three dimensional display device according to claim 38, wherein said solid state scan type comprises one selected from a group consisting of flat and curved scanners.

40. (Original) The three dimensional display device according to claim 34, wherein said aperture plate comprises a Ferroelectric LCD device.

41. (Original) The three dimensional display device according to claim 21, wherein a number of vertical viewing angles is less than a number of horizontal viewing angles.

42. (Previously presented) A solid state three dimensional display device comprising:

a display matrix;

a substrate; and

an LCD dynamic parallax barrier, including apertures and opaque areas formed by closed apertures between open apertures, said display matrix and said LCD dynamic parallax barrier being bonded to opposing sides of said substrate;

wherein the LCD dynamic parallax barrier is configured such that the open apertures scan the LCD dynamic parallax barrier in two-dimensional movements to generate an illusion that the opaque areas are transparent;

wherein the solid state three dimensional display device generates a three dimensional display exhibiting both horizontal and vertical parallax;

wherein the three dimensional display provides multiple different perspectives of a scene that form perceived 3D images of the scene which are simultaneously viewable from respective multiple different user viewing angles with respect to an open LCD dynamic parallax barrier opening.

43. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said substrate has a thickness in a range of 0.1cm – 5cm.

44. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said display matrix comprises pixels, said apertures having a size not smaller than a size of said pixels.

45. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said display matrix comprises a color FLCD device.

46. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said LCD dynamic parallax barrier comprises a FLCD device.

47. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said display matrix comprises a display having a frame rate exceeding 150 frames per second.

48. (Previously presented) The solid state three dimensional display device according to claim 47, wherein said display matrix comprises a display having a frame rate no greater than 20,000 frames per second.

49. (Previously presented) The solid state three dimensional display device according to claim 42, wherein the horizontal parallax comprises a horizontal view angle range of 20 – 60 degrees.

50. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said horizontal parallax has a viewable operating range up to 180 degrees.

51. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said vertical parallax comprises a vertical view angle range of 10 – 50 degrees.

52. (Previously presented) The solid state three dimensional display device according to claim 42, wherein said vertical parallax has a viewable operating range up to 180 degrees.

53. (Canceled).

54. (Canceled).

55. (Canceled).

56. (Canceled).

57. (Previously presented) A solid state three dimensional display device comprising:

a flat screen Ferroelectric LCD display matrix;

a substrate; and

a flat screen Ferroelectric LCD dynamic parallax barrier, including apertures and opaque areas formed by closed apertures between open apertures, said display matrix and said FLCD dynamic parallax barrier being bonded to opposing sides of said substrate;

wherein the flat screen Ferroelectric LCD dynamic parallax barrier is configured such that the open apertures scan the flat screen Ferroelectric LCD dynamic parallax barrier in two-dimensional movements to generate an illusion that the opaque areas are transparent;

wherein the display device generates a three dimensional display exhibiting both horizontal and vertical parallax;

wherein the three dimensional display provides multiple different perspectives of a scene that form perceived 3D images of the scene which are simultaneously viewable from respective multiple different user viewing angles with respect to an open Ferroelectric LCD dynamic parallax barrier opening.

58. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said substrate has a thickness in a range of 0.1cm – 5cm.

59. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said display matrix comprises pixels, said apertures having a size not smaller than a size of said pixels.

60. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said display matrix comprises a color FLCD device.

61. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said LCD dynamic parallax barrier comprises a FLCD device.

62. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said display matrix comprises a display having a frame rate exceeding 150 frames per second.

63. (Previously presented) The solid state three dimensional display device according to claim 62, wherein said display matrix comprises a display having a frame rate no greater than 20,000 frames per second.

64. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said horizontal parallax comprises a horizontal view angle range of 20 – 60 degrees.

65. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said horizontal parallax has a viewable operating range up to 180 degrees.

66. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said vertical parallax comprises a vertical view angle range of 10 – 50 degrees.

67. (Previously presented) The solid state three dimensional display device according to claim 57, wherein said vertical parallax has a viewable operating range up to 180 degrees.

68. (Previously presented) A three dimensional display device comprising:

a flat screen display having pixels and a pixel width;

a flat aperture plate including apertures and opaque areas formed by closed apertures between open apertures that is disposed in front of said display screen;

wherein the flat aperture plate is configured such that the open apertures scan the flat aperture plate in two-dimensional movements to generate an illusion that the opaque areas are transparent; and

a gap separating said display screen and said aperture plate, said gap being within a range of 0.1cm – 5cm;

wherein the three dimensional display provides multiple different perspectives of a scene which are simultaneously viewable from multiple different user viewing angles with respect to an open aperture.

69. (Original) The three dimensional display device according to claim 68, wherein said flat screen display and said flat aperture plate comprise a Ferroelectric LCD device.

70. (Original) The three dimensional display device according to claim 68, wherein said flat screen display and said flat aperture plate have frame rates exceeding 150 frames per second.

71. (Previously presented) The three dimensional display device according to claim 70, wherein said flat screen display comprises a display having a frame rate no greater than 20,000 frames per second.

72. (Previously presented) The three dimensional display device according to claim 68, wherein the multiple different user viewing angles comprise a horizontal view angle range of 20 – 60 degrees.

73. (Previously presented) The three dimensional display device according to claim 68, wherein the multiple different user viewing angles comprise a horizontal viewable operating range up to 180 degrees.

74. (Previously presented) The three dimensional display device according to claim 68, wherein the multiple different user viewing angles comprise a vertical view angle range of 10 – 50 degrees.

75. (Previously presented) The three dimensional display device according to claim 68, wherein the multiple different user viewing angles comprises a vertical viewable operating range up to 180 degrees.

76. (Previously presented) A three dimensional display device comprising:

a hybrid screen display having pixels and a pixel width;

a flat aperture plate including apertures and opaque areas formed by closed apertures between open apertures that is disposed in front of said display screen;

wherein the flat aperture plate is configured such that the open apertures scan the flat aperture plate in two-dimensional movements to generate an illusion that the opaque areas are transparent; and

a gap separating said display screen and said aperture plate, said gap being within a range of 0.1cm – 5cm;

wherein the three dimensional display simultaneously provides multiple different viewable perspectives of a scene based on horizontal and vertical viewing angles with respect to an open aperture.

77. (Original) The three dimensional display device according to claim 76, wherein said hybrid screen display comprises a high speed video projector and a display screen.

78. (Previously presented) The three dimensional display device according to claim 76, wherein the horizontal viewing angles comprise a horizontal view angle range of 20 – 60 degrees.

79. (Previously presented) The three dimensional display device according to claim 76, wherein said horizontal viewing angles has a viewable operating range up to 180 degrees.

80. (Previously presented) The three dimensional display device according to claim 76, wherein said vertical viewing angles comprise a vertical view angle range of 10 – 50 degrees.

81. (Previously presented) The three dimensional display device according to claim 76, wherein said vertical viewing angles have a viewable operating range up to 180 degrees.